WEATHER PROGRAM

Applied research to minimize the impact of weather on the NAS, including:

- Specific initiatives to support NextGen Weather Operational Improvements contained in the NextGen Segment Implementation Plan
- Collaborative, complimentary initiatives with the NWS to transition legacy capabilities to meet current and future requirements
- Focused initiatives to help mitigate safety and/or efficiency issues associated with well documented weather problems.

Key Weather Program portfolio accomplishments include:

In-flight Icing

Project Overview: Improve in-flight icing diagnosis and forecasting capabilities to reduce aircraft icing related accidents and fatalities in the National Airspace System (NAS).

Recent Accomplishments: Transitioned High Resolution (HiRes)(13km) Current Icing and Forecast Icing Products to National Weather Service for implementation on operational Aviation Digital Data Service

Advanced Weather Radar Techniques (AWRT)

Project Overview: Develop CONUS high-res convective activity depiction via integration of multiple radar/sensor data; maximize benefits of dual polarization data for distinguishing false weather returns while improving situational awareness of hazardous weather conditions at the surface and aloft.

Recent Accomplishments: WJHTC Multi-Radar Multi-Sensor (MRMS) capability available with a 30 second product update cycle; Aviation Weather Hazard Product that will display airspace that may be negatively affected by various types of precipitation, and is expected to enhance in-flight icing products

Model Development and Enhancement

Project Overview: Develop and enhance operational (at NWS) weather models to improve forecasts of aviation hazards including in-flight icing, turbulence, convective storms, & restricted ceilings & visibility.

Recent Accomplishments: Implementation of Rapid Refresh v2 model at NWS (improvements to wind, temperature, cloud, and convective forecasts)

Turbulence

Project Overview: Improve of turbulence observation and forecasting capabilities to enhance NAS safety, efficiency, and capacity.

Recent Accomplishments: Completed development of mountain-wave turbulence forecast capability for all flight levels

Volcanic Ash

Project Overview: Enhancement and global harmonization of ash transport and dispersion forecast models resulting in safer, more efficient operations during and after volcanic eruptions.

Recent Accomplishments: Initial development of a prototype webpage for exchanging information between Volcanic Ash Advisory Centers and guidance to facilitate product standardization.

Quality Assessment

Project Overview: Independent meteorological quality assessments of transitioning Wx Program capabilities; Verification methodologies are designed to provide operationally relevant results for aviation/air traffic end users; results support transition to Ops decisions

Recent Accomplishments: CIP/FIP Hi-Res product evaluation; Analysis of feasibility of utilizing satellite observations for use in Alaska icing evaluations; Analysis of feasibility of utilizing MRMS data for use in identifying thunderstorms for convective evaluations

Forecast Uncertainty

Project Overview: Create guidance for integrating weather uncertainty information into decisions for NAS decision support tools (DST) in the NextGen era.

Recent Accomplishments: Completed final report recommending a potential transition strategy for producing and interpreting convective weather DSTs.

Oceanic Convection

Project Overview: Probabilistic convection guidance with lead times from 0 to 36 hours used for current operations and strategic planning of transoceanic flights

Recent Accomplishments: Developed initial prototype of probabilistic convective guidance out to 36 hours with associated verification techniques

Forecast Confidence Measurement

Project Overview: Assess how well the 2-8 hour CoSPA convective forecast is doing to provide operators an up-to-date measure of confidence in using the product

Recent Accomplishments: Developed an algorithm to provide forecast confidence related to capacity reduction in enroute airspace now ready for meteorological quality assessment

Lightning Nowcasting

Project Overview: Standardized but tailorable guidelines for ramp closure implementation due to lightning, improve safety of airport personnel and gain efficiencies in terminal operations

Recent Accomplishments: Documented operational inefficiencies at additional airports due to inadequate ramp closure procedures; began documentation of impacts to the NAS

Research Evolution Planning (REP)

Project Overview: Overarching guidance & strategic direction that facilitates identification, selection, prioritization, & effective management of applied aviation weather research areas; foundational guidance for Weather Program & research partners during planning and execution & connects near-term requirements to longer-term research strategy with line of sight connectivity to NextGen goals.

Recent Accomplishments: Winter Weather, Terminal Wind, and Numerical Model REPs

Ceiling and Visibility (C&V) Alaska (AK)

Project Overview: Enhance ceiling and visibility analysis information in Alaska by exploiting advances in weather satellites, numerical models & weather cameras with the goal of improving GA flight safety.

Recent Accomplishments: Feasibility Assessment, Concept of Operations for AK C&V analysis capability

Mitigating the High Ice Water Content (HIWC) Ice Crystal Weather Threat to Engines

Project Overview: Characterize the HIWC ice crystal environment that poses a threat to turbine engines via data from field programs; develop detection, diagnosis and forecast capabilities

Recent Accomplishments: Complete comprehensive flight test campaign in coordination with Europeans, obtaining high quality data to be utilized for assessment of certification envelopes and development of diagnosis and forecast algorithms

Terminal Area Icing Weather Information for NextGen (TAIWIN)

Project Overview: Mitigate NAS impacts of super- cooled large drops (SLD) and other icing conditions on terminal area operations and facilitate adoption of operational procedures and/or develop guidance associated with new certification rules on SLD

Recent Accomplishments: Completed a study (with implications for both safety and capacity/efficiency) of snowfall variability across a terminal to determine the validity of deicing fluid holdover times based on a single point observation